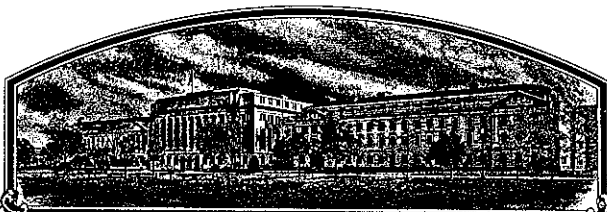


No.

8500109



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

HybriTech Seed International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS SEED OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS DETERMINED BY THE OWNER OF THE RIGHTS. (34 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Bighorn'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of December in the year of our Lord one thousand nine hundred and eighty-eight.

Attest:

Kenneth H. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPROVAL EXPIRES 4-30-85

FORM APPROVED: OMB NO. 0681-0055

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) HYBRITECH SEED INTERNATIONAL, INC. Rohm and Haas Seeds Inc.	2. TEMPORARY DESIGNATION 78W296	3. VARIETY NAME Bighorn
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 5912 N. MERIDIAN Independence Mall West Philadelphia, PA 19105 WICHITA, KS 67204	5. PHONE (Include area code) (316) 755-1249 (215) 592-3113	FOR OFFICIAL USE ONLY PVPO NUMBER 8500109

6. GENUS AND SPECIES NAME Triticum aestivum L.	7. FAMILY NAME (Botanical) Gramineae	FILING DATE 4/12/85 TIME 8:30 <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.
--	--	--

8. KIND NAME Common Wheat	9. DATE OF DETERMINATION September, 1981	AMOUNT FOR FILING \$ 1,800 DATE 4/12/85
-------------------------------------	--	--

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation	AMOUNT FOR CERTIFICATE \$ 200.00 DATE October 27, 1988
---	---

11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware	12. DATE OF INCORPORATION February 1983
---	---

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS POLLY E. RAMSTAD, ESQ. Dr. James E. Stroike JOHN R. ERICKSON, WHEAT RESEARCH DIRECTOR HYBRITECH SEED INTERNATIONAL, INC. 5912 N. MERIDIAN WICHITA, KS 67204 PHONE (Include area code): (316) 755-1249 (215) 592-3113

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)
d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety.
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. (SEE EXHIBIT A)

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.)	<input checked="" type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below)	<input checked="" type="checkbox"/> No
---	--	--

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Foundation <input checked="" type="checkbox"/> Registered <input checked="" type="checkbox"/> Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?	<input type="checkbox"/> Yes (If "Yes," give date)	<input checked="" type="checkbox"/> No
---	--	--

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?	<input checked="" type="checkbox"/> Yes (If "Yes," give names of countries and dates)	<input type="checkbox"/> No
United States - September 1984		

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT James E. Stroike	DATE 3/25/85
SIGNATURE OF APPLICANT	DATE

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY

Bighorn is the result of hybridization, individual plant selection, and individual head selection from the cross:

Warrior/Minn. III-54-12//Sturdy/3/Winoka/Ark made by the Northrup King Company. Our pedigree for this variety is N5283-1N-3F-4E-ON.

Bighorn is the result of a double cross between two F_1 's we made in the greenhouse at Eden Prairie, MN in 1972. The female F_1 parent was Warrior/Minn III-54-12//Sturdy. The Winoka/Ark F_1 was used as the male. The parental F_1 's were made in the greenhouse in 1973 at Eden Prairie. The F_2 was space-planted at York, Nebraska during 1973-74. Seed from the F_2 plant was seeded in the fall of 1974 at York, Nebraska and Moorhead, Minnesota. In 1975, a F_3 plant was selected at Moorhead. Seed from this F_3 plant selection was planted as a F_4 plant progeny row at Eden Prairie and York. The F_4 row at York had excellent winter survival while many nursery materials were lost in 1975-76 due to winterkill. A F_4 plant was selected at Eden Prairie in 1975 and the seed was planted as a F_5 plant progeny row at York.

In 1976-77 the F_5 plant progeny row at York was harvested to provide seed for 1978 preliminary yield trials at York, Nebraska; Billings, Montana; and Othello, Washington. The preliminary yield trial code number was 78W296 which was retained as the permanent experimental variety number. Intermediate yield trials were planted in 1978-79 by using bulk seed from the preliminary trial at York.

From the York preliminary trial (F_6) ten heads were selected and threshed individually for F_7 head-purification plots at Yuma, Arizona in 1978-79. Each head-row was harvested at Yuma and the seed was used to evaluate sister lines in a replicated yield trial at York in 1979-80. Five head-row sib lines were retained for 1980-81 replicated yield trials at York and Moorhead. After harvest in 1981 one head-row line was identified as the best sister line, 79AWH10940 was increased as breeders seed at Yuma in 1981-82. This F_8 increase from an F_7 head-row was identified as 82AWH20074.

Bighorn, 78W296, was entered in the 1982 and 1983 Northern Regional Performance Nursery for testing experimental hard red winter wheats. In 1981-82 NRPN trials the average yield of Bighorn over 18 locations was 3211 kg/ha or 118% of Roughrider and 110% of Warrior. The 1982-83 NRPN average yield for Bighorn, across 17 locations was 3355 kg/ha or 115% of Roughrider and 109% of Warrior.

This variety appears uniform and stable. There are no unusual or characteristic variations that have been observed to date. Breeders seed, lot 7658, was produced at Othello, Washington

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY Continued

during 1982-83. In 1983-84 Foundation seed was produced near Marienthal, Kansas. This production was inspected and approved by the Kansas Crop Improvement Association.

In July, 1984, Rohm and Haas Seeds, Inc. purchased the hard red winter wheat breeding germ plasm from Northrup King Company. The ownership of Bighorn was transferred to Rohm and Haas Seeds at this time.

EXHIBIT B

NOVELTY STATEMENT

Bighorn is most similar to "Roughrider" but differs in plant height. Plant height for Bighorn averages 17-18 cm shorter than Roughrider, depending upon the environment. The range for height difference between Bighorn and Roughrider has been observed to be 11-24 cm based on data accumulated over a four year period at two different locations.

Table 1. Heading dates for Bighorn in comparison to check varieties grown in replicated small plot trials at York, NE; and Moorhead, MN.

Location and Year	Heading Date (Days from Jan. 1)		
	Bighorn	Centurk 78	Roughrider
<u>York, NE</u>			
1980	148	145	148
1981	142	136	142
1982	156	152	157
1983	<u>159</u>	<u>157</u>	<u>160</u>
4 - Year Average	151.3	147.5	151.8
<u>Moorhead, MN</u>			
1980	155	-	155
1981	160	-	164
1983	170	169	171
1984	<u>159</u>	<u>-</u>	<u>159</u>
4 - Year Average	161.0	-	162.3

Table 2. Relative maturity for Bighorn in comparison to check varieties grown in replicated small plot trials at York, NE; and Moorhead, MN.

Location and Year	Relative Maturity ^{1/} (1-9)		
	Bighorn	Centurk 78	Roughrider
<u>York, NE</u>			
1980	8	5	6
1981	7	4	6
1983	<u>7</u>	<u>5</u>	<u>6</u>
3 - Year Average	7.3	4.7	6.0
<u>Moorhead, MN</u>			
1981	3	-	4
1983	5	6	7
1984	<u>5</u>	<u>-</u>	<u>6</u>
3 - Year Average	4.3	-	5.7

^{1/} 1-9 Scale where 1=very early and 9=very late.

Table 3. Height for Bighorn in comparison to check varieties grown in replicated small plot trials at York, NE; and Moorhead, MN.

Location and Year	Height (cms)		
	Bighorn	Centurk 78	Roughrider
<u>York, NE</u>			
1980	85	100	103
1981	85	93	115
1982	90	106	101
1983	<u>103</u>	<u>117</u>	<u>117</u>
4 - Year Average	90.8	104.0	109.0
<u>Moorhead, MN</u>			
1980	57	-	81
1981	89	-	106
1983	79	81	92
1984	<u>85</u>	<u>-</u>	<u>101</u>
4 - Year Average	77.5	-	95.0

Table 4. Winter survival scores for Bighorn in comparison to check varieties grown in replicated small plot trials at York, NE and Moorhead, MN from 1980-1984.

Location and Year	Winter Survival (0-9) ^{1/}		
	Bighorn	Centurk 78	Roughrider
<u>York, NE</u>			
1980	9	9	9
1982	<u>9</u>	<u>8</u>	<u>9</u>
2 - Year Average	9.0	8.5	9.0
<u>Moorhead, MN</u>			
1980	9	-	9
1981	9	-	9
1983	8	6	9
1984	<u>9</u>	<u>-</u>	<u>8</u>
4 - Year Average	8.8	-	8.8

^{1/} Winter survival scale where 9 is best with 90-100% survival.

Table 5. Field ratings for leaf and stem rust of Bighorn in comparison to check varieties grown in replicated small plot trials at York, NE and Moorhead, MN.

Location and Year	Leaf Rust			Stem Rust		
	Bighorn	Centurk 78	Rough- rider	Bighorn	Centurk 78	Rough- rider
<u>York, NE</u>						
1981	10MS	10S	10S	-	TS	TS
1982	10S	15S	70S	R	TS	R
1983	5S	10S	30S	TS	TS	TS
<u>Moorhead, MN</u>						
1980	0	-	TS	-	-	-
1981	5MS	-	30S	-	-	-
1983	10S	20S	10S	R	R	R
1984	10S	-	40S	-	-	-

Table 6. Quality characteristics of Bighorn and checks at York, Nebraska in 1979 and 1980.

Characteristics	1979			1980		
	Bighorn	Centurk	Scout 66	Bighorn	Agate	Roughrider
Wheat Protein	13.85	14.40	13.50	14.20	14.30	14.90
Test Weight	58.5	59.1	59.4	58.5	61.6	62.0
Milling Ext. %	72.6 G	69.5 G-	71.5 G	72.4 G	72.2 G	71.5 G
Farinograph						
Absorption	57.5	59.0	59.0	58.0	60.4	60.6
Peak	8.00	9.00	5.50	6.50	10.25	6.50
Stability	19.50	28.00	9.25	15.50	17.50	16.50
MTI	20	15	40	25	15	30
Valorimeter	73.0	78	60	67	79	68
Flour						
Ash	.438	.371	.366	.464	.370	.417
Protein	12.85	13.25	12.50	13.20	13.30	13.90
Bake						
Absorption	60.0 F+	62.5 G-	63.0 G	61.0 G	63.0 G	64.0 G
Mix	5.50 G-	6.50 G-	4.25 G	5.00 VG	5.50 G-	3.75 G
Dough	6 G	6 G	6 G	6 G	5 G-	6 G
Loaf Vol. cc	1000 VG	1000 EX-	1000 VG	985 VG-	910 G	1000 EX
Crumb Grain	6 G	6 G	6 G	5 G-	6 G	5 G-
Crumb Texture	6 G	6 G	6 G	6 G	6 G	5 G
Crumb Color	97 G	97 G	97 G	97 G	97 G	97 G
Bake Score	31 G	32 G	32 G	32 G	28 G-	32 G-
Overall Score	60 G-	62 G-	62 G-	60 G-	60 G-	61 G-

8500109

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

FOR OFFICIAL USE ONLY

PVPO NUMBER

8500109

VARIETY NAME OR TEMPORARY
DESIGNATION

Bighorn

Rohm and Haas Seeds, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

Independence Mall West
Philadelphia, PA 19105

Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. KIND:

1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 = SPRING 2 = WINTER 3 = OTHER (Specify) _____ 1 = SOFT 3 = OTHER (Specify) _____
2 = HARD _____

1 = WHITE 2 = RED 3 = OTHER (Specify) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
 NO. OF DAYS LATER THAN 4 = LEMHI 5 = NUGAINES 6 = LEEDS
7 = Centurk 78

5. PLANT HEIGHT (From soil level to top of head):

CM. HIGH
 CM. TALLER THAN 7 = Centurk 78
 CM. SHORTER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (See reverse):

1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTER COLOR:

1 = YELLOW 2 = PURPLE

8. STEM:

Anthocyanin: 1 = ABSENT 2 = PRESENT Waxy bloom: 1 = ABSENT 2 = PRESENT

Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT Internodes: 1 = HOLLOW 2 = SOLID

NO. OF NODES (Originating from node above ground)

CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

Anthocyanin: 1 = ABSENT 2 = PRESENT Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

Flag leaf at booting stage: 1 = ERECT 2 = RECURVED
3 = OTHER (Specify) _____

Flag leaf: 1 = NOT TWISTED 2 = TWISTED

Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

MM. LEAF WIDTH (First leaf below flag leaf)

CM. LEAF LENGTH (First leaf below flag leaf)

11. HEAD:

☒ 3 Density: 1 = LAX 2 = DENSE 3 = Middense ☒ 1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____
☒ 4 Awedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED
☒ 4 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify) _____
 CM. LENGTH MM. WIDTH

12. GLUMES AT MATURITY:

☒ 2 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.) ☒ 2 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)
☒ 2 Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE ☒ 3 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

☒ 1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

☒ 1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

☒ 1 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

☒ 1 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL ☒ 1 Cheek: 1 = ROUNDED 2 = ANGULAR
☒ 1 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG ☒ 1 Brush: 1 = NOT COLLARED 2 = COLLARED
☒ 4 Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK
☒ 3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____
 MM. LENGTH MM. WIDTH GM. PER 1000 SEEDS

17. SEED CREASE:

☒ 1 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'
☒ 1 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☒ 2 STEM RUST (Races) OFBS, OSHS ☒ 2 LEAF RUST (Races) _____ ☐ 0 STRIPE RUST (Races) _____ ☐ 0 LOOSE SMUT
☒ 1 POWDERY MILDEW ☐ 0 BUNT ☐ OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

☐ 0 SAWFLY ☐ 0 APHID (Bydv.) ☐ 0 GREEN BUG ☐ 0 CEREAL LEAF BEETLE
☐ OTHER (Specify) _____ HESSIAN FLY RACES: ☐ 1 GP ☐ 0 A ☐ 1 B ☐ 0 C
☐ 0 D ☐ 0 E ☐ 0 F ☐ 0 G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Winoka	Seed size	Winoka
Leaf size	Sturdy	Seed shape	Winoka
Leaf color	Sturdy	Coleoptile elongation	Sturdy
Leaf carriage	Sturdy	Seedling pigmentation	Sturdy

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.W. Briggie and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.
- (b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

FORM LFGS 470-6 (3-79) (Reverse)

APR 12 1985

12

EXHIBIT D

ADDITIONAL DESCRIPTION OF THE VARIETY

Bighorn is a cultivar of Triticum aestivum L. with winter growth habit. The kernels are hard, red, and ovate in shape with rounded cheeks. Kernel length is midlong and width is midwide. The brush is short and not collared. Phenol reaction of the seed is brown-black similar to "Wakeland". The spike is awned, mid-dense, and tapered in shape. The glumes are white, glabrous, midlong and midwide. Glume shoulders are oblique. Beaks are acuminate in shape and 8-16 mm long.

The coleoptile color is white and seedling anthocyanin is absent. Juvenile plant growth is prostrate. Plant color at booting is green. Waxy bloom is present on the stem and flag leaf sheath. The auricles normally do not have anthocyanin and short hairs are present on the auricles. Generally three nodes originate from the node above ground.

Bighorn is a semidwarf variety with winterhardiness similar to "Roughrider". Maturity is medium late which is slightly later than Roughrider. Days to heading are nearly equal to Roughrider. Bighorn has adult plant resistance, probably from the Sturdy parent, to some races of leaf rust (Puccinia recondita). Seedling stem rust reactions to physiologic races of Puccinia graminis f. sp. tritici. have been conducted by the Cereal Rust Laboratory. The following reactions were observed to these isolates:

<u>Isolate</u>	<u>Reaction</u>
<u>15B-2</u>	
TNMH	S
TNMK	S
<u>151</u>	
QFBS	0
QFHS	0
<u>11-32-113</u>	
RHRS	S
RSHS	0
RTQQ	S
RTQS	S

It's postulated Bighorn has the Tt-1 gene for adult plant stem rust resistance from the "Ark" parent since there is a low incidence of rust in the field at the adult stage.

Milling and baking quality is satisfactory. Bake mix time is somewhat longer than Roughrider while bake absorption tends to be lower than Roughrider.

EXHIBIT D

8500109

Table 7. Quality characteristics of Bighorn and checks at York, Nebraska in 1981.

Characteristics	Bighorn	Agate	Roughrider
Wheat Protein	13.25	14.20	14.20
Test Weight	60.4	61.3	60.2
Milling Ext. %	71.5 G	70.3 G-	69.0 G-
Farinograph			
Absorption	53.8	58.6	60.6
Peak	13.00	12.00	10.00
Stability	32.00	20.50	26.00
MTI	10	5	10
Valorimeter	86	85	80
Flour			
Ash	.427	.350	.408
Protein	12.25	13.10	13.00
Bake			
Absorption	60.5 E+	62.5 G-	64.0 G
Mix	7.00 G-	6.50 G-	6.50 G-
Dough	5 G-	6 G	6 G
Loaf Vol. cc	860 G-	910 G	1000 VG
Crumb Grain	4 F	5 G	6 G
Crumb Texture	5 G	6 G	6 G
Crumb Color	97 SD	97 G	97 SD
Bake Score	24 F+	28 G-	31 G
Overall Score	52 G-	57 G-	61 G-

ASSIGNMENT

8500109

WHEREAS, Rohm and Haas Seeds Inc., a Delaware corporation, with its principal offices at Independence Mall West, Philadelphia, Pennsylvania 19105 ("Rohm and Haas Seeds"), is the owner of the entire right, title and interest to the following varieties, U.S. Plant Variety Certificates and applications therefore:

<u>Variety</u>	<u>Certificate No.</u>	<u>Grant Date</u>
Prodax	7500005	06/30/75
Solar	7800010	03/29/79
711	8100013	12/10/81
Walera	8200002	06/17/82
715	8300068	01/31/86
835	8200006	03/11/82
817	8200033	06/17/82
830	8200094	09/23/82
Norak	8500105	03/11/88

	<u>Application No.</u>	<u>Filing Date</u>
✓ Bighorn	8500109	04/12/85
Pony	8500107	04/12/85
Rodeo	8500106	04/12/85

WHEREAS, HybriTech Seed International, Inc., a Delaware corporation and wholly-owned subsidiary of Monsanto Company, with its principal offices at 800 North Lindbergh Boulevard, St. Louis, Missouri 63167 ("HybriTech") is desirous of acquiring the entire interest in the aforementioned varieties, certificates and applications;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Rohm and Haas Seeds does hereby sell, assign and transfer unto HybriTech, the entire right, title and interest in and to the varieties, certificates and applications for its use and benefit and for its successors and assigns.

IN TESTIMONY WHEREOF, Rohm and Haas Seeds intending to be legally bound has caused this assignment to be executed by its duly authorized officer.

ROHM AND HAAS SEEDS INC.

By Harold G. Mykay
 Title Vice President

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COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF PHILADELPHIA)

On this 25 day of July, 1988, before me appeared
Howard A. Mergelkamp Jr. of Rohm and Haas Seeds
Inc., the person who signed this instrument, who acknowledged
that he signed it as a free act on behalf of Rohm and Haas
Seeds, Inc. with authority to do so.

Elaine Sherman
Notary Public

ELAINE SHERMAN
Notary Public, Phila., Phila. Co.
My Commission Expires June 1, 1992

